2014–15
ANNUAL REPORT

PUBLISHED JUNE 2015

Alberta Innovates Bio Solutions

Alberta Innovates
Bio Solutions

Alberta
Canada

Funded by the Government of Alberta

ALBERTA INNOVATES - BIO SOLUTIONS
2014–15 Annual Report

Published June 2015
Printed in Canada

To access this document online, visit www.bio.albertainnovates.ca and search for "2014–15 Annual Report."

Contents

1. Executive Summary 1
2. Accountability Statement 3
3. Management's Responsibility for Reporting 3
4. Message from the Board Chair 4
5. Performance Measurement – Reporting on Results 5
6. Management's Discussion and Analysis 22
7. Operational Overview 22
8. Audited Financial Statements 24

1. Executive Summary

Alberta Innovates Bio Solutions (AI Bio) has a legislative mandate to provide leadership and coordination that support the growth and diversification of Alberta's agriculture, food, and forest sectors. AI Bio meets its mandate by funding quality research, evaluating technologies and emerging opportunities, facilitating connections, creating and expanding networks, and advancing knowledge.

The current downturn in oil prices reconfirms the importance of a diverse economy. The province's agriculture, food and forest industries can contribute in a more significant way to strengthening Alberta's economy as they currently generate $33 billion in sales.

In our fifth full year of operation, the wide-ranging expertise of our Board has guided our allocation of research funding in our priority areas of sustainable production, food innovation, bioindustrial innovation, ecosystem services, and prion and protein misfolding diseases.

Using the performance measures developed in 2012–13 and maintained for 2013–14, AI Bio assessed this year's achievement of immediate outputs (results occurring directly due to our influence and support) and immediate outcomes (areas of impact to which we contributed). These outcomes and outputs are summarized in a table (beginning on page 5) for each priority area. Below each table, key achievements in that area are listed along with the long-term outcomes and initiatives each achievement supports.

The following are examples of AI Bio's significant achievements during 2014–15:

- AI Bio built on previous investments with Genome Canada in a project evaluating the genetic adaptive capacity, resilience, and productivity of Alberta's breeding populations of lodgepole pine and white spruce in the face of a changing climate. This project will provide science-based knowledge for development of improved seed transfer guidelines for the province.

- AI Bio supported a canola research project that determined that delayed application of certain herbicides can compromise the herbicide tolerance of HR canola, reducing crop yield and quality. The results influenced the development of a canola hybrid with higher herbicide tolerance and helped canola producers to better evaluate the risks associated with late herbicide application.

- In March 2015, the Alberta Bio Future Program (ABF) was launched; Equipment Utilization was the first subprogram to begin taking in applications. ABF aims to accelerate growth of Alberta's bioindustrial sector, enhance the province's reputation as a bioproducts innovation hub, and increase the diversification of Alberta's economy. This $20.8-million five-year program is led by AI Bio and co-funded by Innovation and Advanced Education.

- With funding from AI Bio and the Alberta Canola Commission, a study was conducted to analyze the anti-cancer properties of designer oils (omega-3 and omega-6 fatty acids). The overall objective of this study was to screen and determine the anti-cancer properties of the oils (alone and in mixtures) on human breast cancer cell lines, and then to verify the findings in a well-established animal model of human breast cancer. This project has provided convincing evidence that certain dietary fatty acids should become more important in our diet.

- With funding from the Climate Change and Emissions Management Corporation (CCEMC) and AI Bio, the Biological Greenhouse Gas (GHG) Management Program contracted nine new research and development projects with a total cash value of $4.7 million. These projects will advance understanding of such critical areas as the genetic link between beef metabolism and GHG emissions, carbon cycling in wetlands, the use of nitrification inhibitors to reduce emissions from crop production, development of a biologically

based spray foam insulation product and the techno-economic potential of algae-based diluents for use by the oil industry.

- The Algar Proof of Concept, led by the Silvacom Group, funded by AI Bio, looked at the changes in ecosystem services and the costs and benefits associated with restoration efforts taking place in the area of Algar, Alberta. This area is of particular importance in Alberta as a significantly disrupted habitat for woodland caribou. The first phase of the project completed a preliminary ecosystem services assessment and cost-benefit analysis to measure water regulation, carbon storage, timber supply, biodiversity intactness, and caribou habitat.

- In early 2015, the Alberta Land Institute, with financial support from AI Bio, launched the Alberta's Living Laboratory Wetlands Project. The study will provide a better understanding of the functional values of wetlands—benefits such as flood mitigation and water purification—and address the practical question of compensation for landowners who agree to restore wetlands on their land.

- The Alberta Prion Research Institute (APRI) continued its partnership with the Alzheimer Society of Alberta and Northwest Territories. Together, the two agencies funded five new research projects through the Alberta Alzheimer Research Program.

- APRI researchers found a number of small portions of the chronic wasting disease prion, which might serve as the basis for vaccine development.

In 2014–15, AI Bio was managing 174 active grant agreements with investment of $67.0 million over the lifetime of the projects and cash leveraging of $158.1 million. The amount of leverage that AI Bio investments are able to achieve shows that AI Bio has ability, skills, and connections valuable to other groups. During this same time, AI Bio also closed 39 projects that resulted in advancements in knowledge and the potential creation of 70 new or improved products, processes, or services, or improved market access.

AI Bio's base funding from Innovation and Advanced Education for core business lines continued in 2014–15 at $11.0 million. In the 2014–15 financial statements, the Statement of Financial Position shows net assets of $8.6 million and cash of $23.1 million, which includes $5.9 million in cash for APRI and $4.6 million for the ABF. Cash has increased by $6.4 million from the 2013–14 reported balance. Because we are able to retain resources into other fiscal years, we can plan for longer-term opportunities in our areas of focus. The $2.2-million increase over last year in deferred revenue is primarily due to a number of partners' increased investments in AI Bio for specific programming.

In the 2014–15 Statement of Operations, revenues of $21.3 million were earned, and $21.1 million in expenses were incurred, resulting in a net operating surplus of $156,000, which slightly increased the accumulated surplus carried forward from previous years to $8.6 million.

AI Bio acknowledges the GOA's stated intent to continue to improve the relevance, effectiveness, and efficiency of the province's innovation system, and we continue to work with the GOA in pursuing this goal. Our programs and partnerships have demonstrated a history of good choices, and we expect to continue delivering needed research and innovation in Alberta. We submit this annual report in the belief that it describes the initiatives and investments that Alberta's agriculture, food, and forest industries require to be profitable and competitive while increasing sustainability.

2. Accountability Statement

AI Bio's annual report for the year ended March 31, 2015, was prepared under the Board's direction in accordance with the Alberta Research and Innovation Regulation and the ministerial guidelines established pursuant to the *Alberta Public Agencies Governance Act*, proclaimed June 12, 2013, and the *Fiscal Management Act*, proclaimed April 1, 2013. All material economic, environmental, or fiscal implications of which we are aware have been considered in the preparation of this report.

ORIGINAL SIGNED BY:

Art Froehlich
CHAIR

3. Management's Responsibility for Reporting

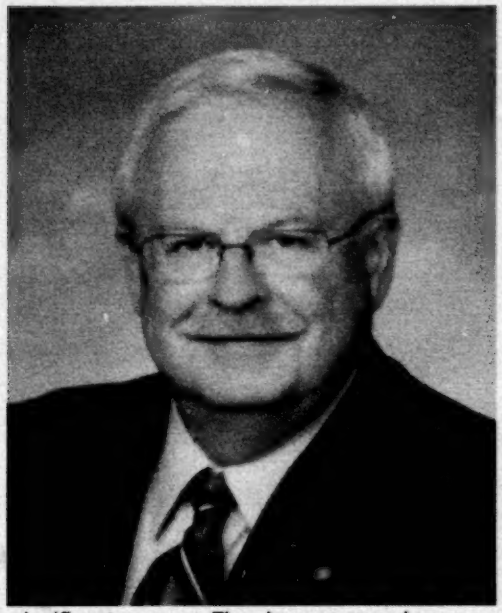
Alberta Innovates Bio Solutions' management is responsible for the preparation, accuracy, objectivity, and integrity of the information contained in the annual report, including the financial statements, performance results, and supporting management information. Systems of internal control are designed and maintained to produce reliable information that meets reporting requirements and to ensure that transactions are executed in accordance with all relevant legislation, regulations, and policies; that reliable financial records are maintained; and that assets are properly accounted for and safeguarded. The annual report has been approved by the Board of Directors and is prepared in accordance with ministerial guidelines.

The Auditor General of the Province of Alberta, the corporation's external auditor appointed under the *Auditor General Act*, performs an annual independent audit of Alberta Innovates Bio Solutions' financial statements in accordance with Canadian generally accepted auditing standards.

ORIGINAL SIGNED BY:

Steve Price
CHIEF EXECUTIVE OFFICER

4. Message from the Board Chair



In late 2014, Albertans were reminded of this province's vulnerability to forces beyond its control. Global petropolitics and a plunge in oil prices had real and immediate impacts on jobs and the amount of money available for the public treasury.

This latest trough in our boom and bust economy once again serves as a cautionary tale about the need to complement the contribution of Alberta's oil and gas sector with other economic activities. At the same time as oil prices were going down, many Albertans and companies were becoming increasingly conscious of "social licence"—a general desire here and abroad for responsible development and environmental stewardship.

Alberta Innovates Bio Solutions is uniquely positioned to contribute to both the diversification of the economy and the expansion of sustainable practices.

The Board and staff of AI Bio are dedicated to growing prosperity in Alberta's agriculture, food, and forest industries through research and innovation. These bio sectors generate significant revenue. They have averaged an annual growth rate of five per cent over the last four years and had sales in the area of $33 billion in 2014.

AI Bio believes research and innovation can contribute to the diversification of Alberta by facilitating even more growth in the bio sectors. AI Bio encourages growth by funding quality research, evaluating technologies and emerging opportunities, facilitating connections, creating and expanding networks, and advancing knowledge.

The agriculture, food, and forest industries are becoming increasingly high-tech and science based, and we can't manage the landscape in the same way that we've done in the past. We need to be progressively more sustainable and efficient. Researchers supported by AI Bio are achieving amazing results on many fronts, like possible new vaccines for chronic wasting disease in deer, elk, and other cervids; new ways to use barley extracts in food and personal care products; controlling listeria bacteria on deli food slicers; and creating wood-based parts in automobiles and packaging.

Now is the time for Alberta to focus on economic diversification and environmental sustainability. AI Bio will continue to play a key role in this evolution.

ORIGINAL SIGNED BY:

Art Froehlich
CHAIR

5. Performance Measurement – Reporting on Results

AI Bio's mandate is to meet the research and innovation priorities of the government by providing leadership and coordination for research and innovation that support the growth and diversification of Alberta's agriculture, forestry, and life sciences sectors. Because AI Bio is a bridge between the private sector, research institutions, government, and others in the research system, we play a key role in fostering a rich innovation infrastructure and a research and development culture of excellence in the biosectors.

In delivering on the *2014–17 Business Plan* over the past year, AI Bio supported investments within five priority research and innovation areas: sustainable production, bioindustrial innovation, food innovation, ecosystem services, and management of prion and prion-like neurological diseases.

Over 2012–13, we developed performance measures for the effectiveness of our investments. These same measures have been used for 2013–14 and again for 2014–15. We evaluated AI Bio–supported projects, programs, or initiatives for which the final report was received by the end of 2014 or which were otherwise considered closed. Using the performance measures, we assessed our achievement of immediate outputs (results occurring directly due to our influence and support) and immediate outcomes (areas of impact to which we contributed).

In the following section, these results are summarized in a table for each priority area. Below each table, key achievements in that area are listed along with the long-term outcomes and initiatives each achievement supports.

In a number of instances, the achievements reported are the culmination of research programs and collaborations that were initiated in previous years, reflecting the legacy investments brought into AI Bio when it was formed in 2010.

Business Line: Sustainable Production

Goal 1: Sustainable Agriculture and Forest Production

Long-Term Outcomes

1. Market-driven traits and products
2. Sustainable production systems

Initiatives

1. Support research and innovation to:
   - 1.1 Increase the yields of Alberta's major crops by improving the efficiency of nutrient and water use and resistance to pests
   - 1.2 Develop new traits in crops to enhance their value
   - 1.3 Identify and/or adapt new crops to Alberta's growing conditions
   - 1.4 Advance the adaptation of forest species to a changing climate
   - 1.5 Inform forest management practices for species at risk, pest control, and restoring disturbed boreal forest lands
   - 1.6 Optimize environmentally sustainable management in agriculture and forestry
2. Continue AI Bio investment in research, development, knowledge translation, and commercialization activities at two Alberta Innovates Centres, Livestock Gentec and Phytola, as well as in other AI Bio–supported initiatives

Results Category	Performance Measure	Actual Results 2014–15
Projects	The number of projects, programs, or initiatives supported by AI Bio for which the final report was received by the end of 2014 or which are otherwise considered closed, and which were evaluated for achievement of outputs or outcomes as reported in the table below	7
Immediate Outcomes		
Knowledge that is likely to lead to a new or improved product, process, or service, or improved market access	The number of potential or actual patents, licence agreements, registrations, etc. (e.g., *Registered a new dry-bean cultivar*)	12
Knowledge that is likely to lead to practice change	The number of potential or actual changes in practice	3
Knowledge that resulted in significant new directions in science or innovation	The number of confirmed proofs of concept, new avenues opened for exploration, new memoranda of understanding, etc. (e.g., *Identified 300 organic compounds residing in the soil throughout the growing season of wheat and canola, which may lead to new farming practices and products*)	2
Immediate Outputs		
Highly qualified personnel developed through our projects, programs, and initiatives	The number of individuals involved on a project, program, or initiative who are supported by a grant or contract and who are undergraduate students, graduate	46

	students, post-doctoral fellows, or post-secondary graduates with a diploma or degree	
Knowledge management that occurred with industry, government, and others	Over the life of a project, program, or initiative, the number of seminars or workshops coordinated, presentations delivered, articles published in non-academic publications, newsletter editions issued, active websites developed, crop walks or tours coordinated, etc. for which the audience was from industry, government, or other sectors	21
Knowledge management that occurred with academia	Over the life of a project, program, or initiative, the number of published peer-reviewed papers, abstracts, or book chapters; scientific conference program or poster presentations; or other endeavours for which the audience was mainly from academia	68

Sustainable Production — Key Achievements in 2014–15

- The Dairy Research and Technology Centre (DRTC), a seven-year program, came to an end in 2014. The DRTC developed knowledge and innovations in dairy production. Its results were communicated to the industry through an effective extension and technology-transfer strategy. For example, the DRTC evaluated the influence of daily light exposure (photoperiod) on the reproduction and lactation of dairy cows. The team identified genetic mechanisms affecting calving time, milk production, and lactation in relation to photoperiod variation, and proposed to producers improved practices for photoperiod management of dairy cattle. (Relevant to long-term outcomes 1 and 2 and initiatives 1.6 and 2.0)

- Over 90% of canola in Western Canada is herbicide-resistant (HR). These cultivars tolerate, with minimal injury, the application of certain herbicides, allowing for the control of a broad spectrum of weeds. AI Bio supported a project evaluating the risks associated with late herbicide applications on HR canola. It was found that delayed application of certain herbicides can compromise the herbicide tolerance of HR canola, reducing crop yield and quality. The results influenced the development of a canola hybrid with higher herbicide tolerance and helped canola producers to better evaluate the risks associated with late herbicide application. (Relevant to long-term outcomes 1 and 2 and initiatives 1.1 and 1.6)

- Seedling blight is a fungal infection that causes canola seedlings to rot. It has a substantial impact on canola establishment and productivity. A project was undertaken to examine the genetic variation of pathogen fungi and the effect of agronomic practices on seedling blight. The genetic studies identified several pathogen fungi and their level of aggressiveness in infecting canola. Field trials indicated that crop rotation and incorporation of barley or oat residue between canola crops may be a useful strategy to reduce seedling blight. The effects of seedling blight may also be reduced by pre-seeding herbicide application and fungicidal seed treatments. (Relevant to long-term outcomes 1 and 2 and initiatives 1.1 and 1.6)

- Modern broiler chicken strains have been selected for rapid growth, increased efficiency, and meat yield. However, they have become more sensitive to incubation conditions, such as temperature and humidity. The effects of breeder flock age and incubation temperature on embryo development were explored. The project found that slightly different incubation conditions may be required as breeder flocks age and that adjusting incubation temperature according to parental flock age resulted in the best-quality chicks. The benefits of these results are that commercial hatcheries can implement subtle changes in incubation conditions within their specific facilities. (Relevant to long-term outcomes 1 and 2 and initiative 1.1)

- Alberta's mean annual temperature has risen between 1 and 1.5 degrees Celsius since about 1940. The forest industry has expressed concern about this temperature increase and its potential negative impacts on forest regeneration, health, and productivity. AI Bio organized two knowledge-exchange seminars in Rocky Mountain House and Grande Prairie. Their purpose was to facilitate discussions between

Environment and Sustainable Resource Development (ESRD) and forest practitioners regarding provincial seed transfer standards and existing opportunities for assisted migration (planting tree seeds native to one area in a different area) as a tool for adaptation to a changing climate. About 60 foresters, woodland managers, ESRD staff, biologists, researchers, and reforestation practitioners attended the seminars. We had the opportunity to share and update industry members on the forestry research that AI Bio is funding to ensure that knowledge gained through research reaches the people who apply it. (Relevant to long-term outcome 2 and initiatives 1.4, 1.5, 1.6, and 2.0)

- We consolidated our collaboration with ESRD in a project that aims to identify genes related to western gall rust in lodgepole pine populations. The resulting information can be applied to the selection of reforestation stocks with superior resistance to this pathogen. AI Bio continued its partnership with ESRD, the Forest Resource Improvement Association of Alberta and Foothills Research Institute in a project examining natural and facilitated lodgepole pine regeneration after mountain pine beetle attacks. Finally, AI Bio built on previous investments with Genome Canada in a project evaluating the genetic adaptive capacity, resilience, and productivity of Alberta's breeding populations of lodgepole pine and white spruce in the face of a changing climate. This project will provide science-based knowledge for development of improved seed-transfer guidelines for the province. (Relevant to long-term outcome 2 and initiatives 1.4, 1.5, 1.6, and 2.0)

- The Agriculture Funding Consortium (AFC) is an informal association of 16 members, including AI Bio. Since its establishment in 2002, the AFC has used a one-window approach to coordinating and facilitating application, assessment, and funding of food and agricultural research proposals. In 2014–15, 70 letters of intent were received for projects totalling $40 million. AI Bio selected four innovative projects with a total value of $4.1 million for investment by AI Bio along with other interested funders. Two of these projects aim to identify traits related to stripe rust and Fusarium blight resistance in wheat, and increased efficiency of nitrogen and water use in barley, respectively. The third project addressed a major priority for the Alberta potato industry: developing potato varieties with reduced acrylamide, a toxic compound that can be found when potatoes are baked at 120 degrees Celsius or higher. The fourth project explores new techniques that would help cereal crops to better assimilate carbon and nitrogen in order to accelerate their yield. (Relevant to long-term outcomes 1 and 2 and initiatives 1.1, 1.2, 1.3, 1.6, and 2.0)

- The Phytola Centre, based at the University of Alberta, is an Alberta Innovates Centre that receives core funding from AI Bio. During 2014–15, the science and operations of the centre continued its progress on several research projects in the area of oilseed biotechnology, enabling the training of graduate students and other highly qualified personnel. Phytola added five new leveraged projects with co-investigators. It is working closely with two industrial partners to advance Genome Canada proposals. Phytola has entered into the international German-Canadian consortium CamOil project initiated last year, strengthening its research network and enhancing our visibility and reputation. The Mitacs Elevate program, which provides funding for postdoctoral fellows in cutting-edge research-project partnerships, is also providing funding, with Alberta Innovates Technology Futures as a partner. Phytola engaged in many knowledge translation/commercialization activities and liaised with industry. (Relevant to long-term outcomes 1 and 2 and initiatives 1.1, 1.2, 1.6, and 2.0)

- Livestock Gentec, based at the University of Alberta, is an Alberta Innovates Centre that receives core funding from AI Bio. In 2014–15, it continued to expand its research and commercialization activities with direct involvement in the training of over 30 graduate students and a research budget of over $40 million in core and project funding. In the past year, Livestock Gentec has revitalized research at the university-owned ranches with new work addressing improved efficiency and sustainable high-quality beef at Roy Berg Kinsella Ranch as well as range-based feed efficiency improvements at the Mattheis Ranch. Livestock Gentec also hosted its first annual field day in 2014 with participation from local agricultural communities, government, and academia. And in the summer of 2014, Livestock Gentec researchers celebrated the achievement of the 200th peer-reviewed publication since the inception of Livestock Gentec in 2010.

The genome sequence of more than 350 Canadian bulls was completed and integrated into the international 1000 bull genomes project. The first analysis has been published, and new information is being incorporated into the work with Canadian breeders and producers. Livestock Gentec was also part of the international collaboration that led to the identification of the causative mutation for reduced susceptibility to porcine respiratory and reproductive syndrome—the most important swine disease globally.

Finally, Livestock Gentec has established a joint Swine Genomics Excellence Centre with China Agricultural University to help find ways of identifying pigs that are more resilient to disease and produce high-quality products with improved efficiency. Delta Genomics Centre, a full-service DNA facility specializing in livestock, has officially spun out of the University of Alberta's business incubation program to become a fee-for-service non-profit organization dedicated to making a difference in the livestock industry. (Relevant to long-term outcomes 1 and 2 and initiatives 1.6 and 2.0)

- Projects in the area of sustainable production benefited from a broad range of partners, including other organizations in the Alberta Innovates group; the Universities of Alberta, Calgary, Lethbridge, Ottawa, and Guelph; Carleton University; ESRD; the Foothills Research Institute; Agriculture and Agri-Food Canada; Agriculture and Rural Development; the Alberta Livestock and Meat Agency; the Alberta Crop Industry Development Fund; the Alberta Canola Producers Commission; the Alberta Pulse Growers Commission; Alberta Milk; Alberta Chicken Producers; the Alberta Barley Commission; the Alberta Wheat Commission; the Canadian Food Inspection Agency; the Canadian International Grains Institute; the Western Grains Research Foundation; and the University of Alberta's Poultry Research Centre, Dairy Research Technology Centre, Alberta Innovates Phytola Centre, and Livestock Gentec Alberta Innovates Centre. (Relevant to long-term outcomes 1 and 2 and initiatives 1.6 and 2.0)

As of March 31, 2015, the Sustainable Production team was managing 41 active projects, 10 of which were in the area of forest sustainability, and 31 in the area of agriculture sustainability.

Goal 2: New Chemicals, Materials, and Energy from Biomass

Long-Term Outcomes

1. New bioindustrial products and processes
2. Bioindustrial sector growth
3. Green building materials and modular construction

Initiatives

1. Facilitate advancements in science and innovation that lead to bioindustrial growth opportunities in four broad areas: biomaterials, biocomposites, biochemicals, and bioenergy (including liquid transportation fuels)
2. Provide data and analysis for science-based policy recommendations that will improve or reduce policy constraints that affect bioindustrial development in Alberta
3. Develop relationships and networks to spur cross-sector innovation between the agriculture, forestry, and oil and gas sectors, and communities (e.g., the Bioeconomy Alberta team, the Alberta Biomaterials Development Centre, the Biorefining Conversions Network, the Canadian Bioenergy Association)
4. Support establishment of a bioindustrial cluster
5. Facilitate advancements in science and innovation that allow for the development of green building materials and new approaches to construction, including modular construction, and develop relationships and networks that spur innovation in building materials and building systems (e.g., the NewBuilds network, the NSERC Industrial Research Chair in Modular Construction, the Canadian Wood Council)

Results Category	Performance Measure	Actual Results 2014–15
Projects	The number of projects, programs, or initiatives supported by AI Bio, for which the final report was received by the end of 2014 or which are otherwise considered closed, and which were evaluated for achievement of outputs or outcomes as reported in the table below	6
Immediate Outcomes		
Knowledge that is likely to lead to a new or improved product, process, or service, or improved market access	The number of potential or actual patents, licence agreements, registrations, etc.	26
Knowledge that is likely to lead to practice change	The number of potential or actual changes in practice	2
Knowledge that resulted in significant new directions in science or innovation	The number of confirmed proofs of concept, new avenues opened for exploration, new memoranda of understanding, etc. (e.g., *Identified 300 organic compounds residing in the soil throughout the growing season of wheat and canola, which may lead to new farming practices and products*)	8
Immediate Outputs		
Highly qualified personnel developed through our	The number of individuals involved on a project, program, or initiative who are supported by a grant or contract and who are undergraduate students, graduate	26

projects, programs, and initiatives	students, post-doctoral fellows, or post-secondary graduates with a diploma or degree	
Knowledge management that occurred with industry, government, and others	Over the life of a project, program, or initiative, the number of seminars or workshops coordinated, presentations delivered, articles published in non-academic publications, newsletter editions issued, active websites developed, crop walks or tours coordinated, etc. for which the audience was from industry, government, or other sectors	13
Knowledge management that occurred with academia	Over the life of a project, program, or initiative, the number of published peer-reviewed papers, abstracts, or book chapters; scientific conference program or poster presentations; or other endeavours for which the audience was mainly from academia	11

Bioindustrial Innovation — Key Achievements in 2014–15

- In March 2015, the Alberta Bio Future[1] Program was launched; Equipment Utilization was the first subprogram to begin taking in applications. ABF aims to accelerate growth of Alberta's bioindustrial sector, enhance the province's reputation as a bioproducts innovation hub, and increase the diversification of Alberta's economy. This $20.8-million five-year program is co-funded by AI Bio and Innovation and Advanced Education and led by AI Bio. AI Bio developed program guidelines for ABF that focused on growing the bioindustrial sector in consultation with Alberta Innovates corporations and ministry partners. The program was designed to create synergies with our external partners and build upon their areas of focus for research and innovation. An international panel also reviewed the guidelines and provided expert advice on implementation. (Relevant to long-term outcomes 1 and 2 and initiatives 1 and 2)

- With a focus on research and development, new product commercialization, access to biomass testing equipment, and knowledge extension, ABF will help to build a more innovative and competitive Alberta. (Relevant to long-term outcomes 1 and 2 and initiatives 1 and 3)

- The Driving Conversion of Alberta's Biomass to Advanced Materials and Chemicals Program (AMCP)[2] was launched in 2010 to provide assistance to Alberta companies looking to use Alberta biomass to commercialize new products for the marketplace. Products range from personal care and cosmetics to bioplastics and biofuels. In 2014–15, three of the five recipients of funding under the AMCP either have completed their projects or are nearing completion, having consolidated operations in Alberta. New processing facilities have been constructed or are under construction, and new products have entered the marketplace. In June 2014, Radient Technologies opened its commercial production plant in Edmonton. Ceapro commenced commissioning of its new facility in Edmonton and began the switch from the old to the new production facility. TerraVerdae Bioworks Inc. encountered numerous start-up problems and delays, but has since made significant progress. In addition, a fifth project was added to AMCP involving incremental funds for the program to construct a significant new lignin product line at a major Alberta pulp mill. (Relevant to long-term outcomes 1 and 2 and initiative 1)

- In 2013, the Bioindustrial Research and Innovation Program was launched. This program focuses on adding value to agriculture and forest biomass through green building materials, components, and

[1] Activities in support of the Alberta Bio Future Program are partially funded through a separate grant agreement that is outside of AI Bio's grant from Innovation and Advanced Education (IAE). A separate report specific to this funding agreement will be submitted to the department.

[2] Activities in support of AMCP are funded through a separate grant agreement that is outside of AI Bio's core grant from IAE. A separate report specific to this funding agreement will be submitted to the department.

technologies, as well as other biomaterials based on cellulose, lignin, and hemicellulose. Projects funded under this program are well underway, with several in the process of completing final reports. Project activities include developing biochar adsorbents, agrifibre-based concrete additives, massive wood plate building components, cellulose nanocrystal–reinforced foams, polyolefin nanocomposites, and standards for building materials and systems. (Relevant to long-term outcomes 1 and 2 and initiatives 1 and 2)

- Research networks and research chairs focused on addressing the needs of Alberta industry are an excellent way to integrate new (leading) research at universities, highly qualified people, and Alberta companies. Several research networks are supported through Al Bio's bioindustrial innovation business line, including the Biorefining Conversions Network (University of Alberta), the NEWBuilds Network (University of New Brunswick), the Industrial Research Chair in the Industrialization of Building Construction (University of Alberta), the Industrial Research Chair in Energy and Environmental Systems Engineering (University of Alberta), and the Athena Chair in Life Cycle Assessment (University of Calgary). These networks provide opportunities for young researchers to work hand in hand with business people to identify issues and develop solutions. (Relevant to long-term outcomes 1 and 2 and initiatives 1 and 3)

- Several new projects were initiated, including new uses of cellulose nanocrystals (CNC), lignin, biobased plastics, supercapacitors, and nanofoams. Phase two of a major initiative focused on the use of biocomposites in automobile manufacturing was completed. Planning for follow-up projects involving the inclusion of CNC and/or lignin-based carbon fibre are under development. (Relevant to long-term outcomes 1 and 2 and initiative 1)

- Al Bio continued to play a leadership role through participation in numerous committees and boards, including the Bioeconomy Alberta Team, the Canadian Standards Association (CSA) Technical Committee on Sustainable Forest Management, several CSA wood products technical committees and the CSA Technical Committee for Cellulose Nanocrystals, IEA Task 39 and Task 43 Committees, and the Alberta Chamber of Resources. (Relevant to long-term outcome 2 and initiatives 3 and 4)

As of March 31, 2015, the Bioindustrial Innovation team was managing 29 active projects. Three of these were in the Advanced Materials and Chemicals program, and 26 were focused on developing and advancing technology and products from biomass and increasing intellectual capacity.

Business Line: Food Innovation

Goal 3: Growth and Diversification of Alberta's Food Industry

Long-Term Outcomes

1. New food ingredients, food products, beverages, and supplements
2. Technologies, products, and processes to control food-borne pathogens
3. Innovative food processing and packaging technologies

Initiatives

1. Invest in research and innovation leading to new or improved food ingredients, food products, beverages, or supplements that:
   - 1.1 Are competitive in the domestic and global marketplace
   - 1.2 Respond to domestic and/or international consumer demand
   - 1.3 Add value to Alberta livestock and crop commodities
   - 1.4 Promote wellness and/or prevent or treat chronic diseases
2. Invest in research and innovation that:
   - 2.1 Contributes to reducing pathogenic *E. coli*, *Salmonella spp.*, *Listeria spp.*, and *Campylobacter spp.* in Alberta livestock, crops, and food and beverage products
   - 2.2 Leads to new food safety policies and enhanced consumer confidence and market access
3. Invest in research and development of innovative platform, processing, and packaging technologies

Results Category	Performance Measure	Actual Results 2014–15
Projects	The number of projects, programs, or initiatives supported by AI Bio, for which the final report was received by the end of 2014 or which are otherwise considered closed, and which were evaluated for achievement of outputs or outcomes as reported in the table below	6
Immediate Outcomes		
Knowledge that is likely to lead to a new or improved product, process, or service, or improved market access	The number of potential or actual patents, licence agreements, registrations, etc.	9
Knowledge that is likely to lead to practice change	The number of potential or actual changes in practice	2
Knowledge that resulted in significant new directions in science or innovation	The number of confirmed proofs of concept, new avenues opened for exploration, new memoranda of understanding, etc. (e.g., *Identified 300 organic compounds residing in the soil throughout the growing season of wheat and canola, which may lead to new farming practices and products*)	4
Immediate Outputs		

Highly qualified personnel developed through our projects, programs, and initiatives	The number of individuals involved on a project, program, or initiative who are supported by a grant or contract and who are undergraduate students, graduate students, post-doctoral fellows, or post-secondary graduates with a diploma or degree	25
Knowledge management that occurred with industry, government, and others	Over the life of a project, program, or initiative, the number of seminars or workshops coordinated, presentations delivered, articles published in non-academic publications, newsletter editions issued, active websites developed, crop walks or tours coordinated, etc. for which the audience was from industry, government, or other sectors	20
Knowledge management that occurred with academia	Over the life of a project, program, or initiative, the number of published peer-reviewed papers, abstracts, or book chapters; scientific conference program or poster presentations; or other endeavours for which the audience was mainly from academia	58

Food Innovation — Key Achievements in 2014–15

- The Food Innovation Team is continuing to implement the strategies identified in the *Alberta Innovates Food Innovation Plan 2014–17*. This strategy document was updated with the newest statistical information on agriculture. It is designed to focus AI Bio's future research and innovation investments in food innovation and support the development of globally competitive new food ingredients and bioactives, food and beverage products, functional foods and nutraceuticals, and technologies and processes that support food safety (particularly meat safety). These areas were identified as the most promising investment opportunities for Alberta based on the province's market demand, its core strengths in agriculture, and its research and industry capacity. (Relevant to long-term outcomes 1, 2, and 3 and initiatives 1.1, 1.2, 1.3, 1.4, 2.1, and 2.2)

- To stimulate innovation in Alberta's food sector, AI Bio hosted two workshops in collaboration with the University of Alberta, the Alberta Food Processors Association, and Agriculture and Rural Development. The workshop Food Innovation: Collaborating for Success was held in Leduc on April 15, 2014, and in Calgary on October 16, 2014. The intent of the workshop was to increase food innovation collaboration between food companies and researchers and to increase food processors' awareness of programs to support food innovation. At the workshop, it was announced that the University of Alberta will offer a new program that aims to prepare students for a career in food manufacturing, the undergraduate Food Science Internship. AI Bio will provide initial funding for the first two years of this program to offer 50% matching of student salaries with industry. The workshops were well received by industry, academics, and government stakeholders. (Relevant to long-term outcomes 1, 2, and 3 and initiatives 1.1, 1.2, 1.3, 1.4, 2.1, and 2.2)

- With funding from AI Bio and the Alberta Canola Commission, a study was conducted to analyze the anti-cancer properties of designer oils (omega-3 and omega-6 fatty acids). The overall objective of this study was to screen and determine the anti-cancer properties of the oils (alone and in mixtures) on human breast cancer cell lines, and then to verify the findings in a well-established animal model of human breast cancer. The study concluded that, at the concentrations tested, all of the longer-chain omega-6 and omega-3 fatty acids that were examined reduced the growth of breast cancer cells, but not of non-tumorigenic cells. This project has provided convincing evidence that certain dietary fatty acids should become more important in our diet. (Relevant to long-term outcome 1 and initiatives 1.1, 1.2, 1.3, and 1.4)

- With funding from AI Bio and the Alberta Crop Industry Development Fund, a study was conducted to identify and develop novel antimicrobial and cholesterol-lowering functionalities of barley proteins for food and personal-care applications. The primary results suggest that modified barley peptides have both antimicrobial and metal-binding capacities. Barley peptides inhibited the growth of pathogenic bacteria

without having undesirable impacts on probiotics. Barley peptides also enhanced mineral (zinc, iron, calcium, and copper) solubility and bioactivity. Because of these traits, the barley peptides that were developed through this project can be used in potential applications such as extending the shelf life of beverage, snack, or nutritional products with natural ingredients; increasing health benefits of nutritional or beverage products; creating innovative cleansing wipes for personal care; and increasing the shelf life and functionalities of cosmetic formulations or products. (Relevant to long-term outcome 1 and initiatives 1.1, 1.2, 1.3, and 1.4)

- Low-salt meat products can present a challenge for the meat industry in terms of food safety and food quality; however, consumers are becoming much more aware of the nutritional quality of the food they eat, and there has been increased focus on reduced sodium in various food products. Low-sodium meat products are less flavourful, have a shorter shelf life, and are more prone to microbial growth compared to conventional meat products. AI Bio and the Alberta Livestock and Meat Association (ALMA) therefore funded a research project on improving the safety and competitiveness of lean, low-sodium meat products. Results showed that occurrences of bacterial growth were indeed generally greater on low-sodium meat products than on regular ones. For low-sodium products, the project developed protective culture cocktails that could be used in formulations to outcompete *Listeria monocytogenes* growth. It was also found that manufacturers' recommendations for antimicrobials like sodium diacetate and sodium lactate should be revised as they were not effective at reducing microbial growth when applied in ready-to-eat meats. (Relevant to long-term outcomes 1, 2, and 3 and initiatives 1.1, 1.2, 1.3, 1.4, 2.1, and 2.2)

- The processed meat industry has been challenged by contamination of ready-to-eat processed meats with *Listeria monocytogenes*. A study was conducted on mitigating *Listeria* in a simulated deli slicing and packaging operation through the application of a live bacteria culture preparation. The research project correctly identified the source of the majority of *Listeria* contamination in sliced deli meats as being the deli slicer itself. This project, funded by AI Bio and ALMA, determined that a culture of *Carnobacterium malaromaticum* on the meat surface provides antimicrobial protection against products that might be contaminated with *Listeria*. The results of this research will provide an additional level of consumer protection by improving the safety of processed meats. (Relevant to long-term outcomes 1, 2, and 3 and initiatives 1.1, 1.2, 1.3, 1.4, 2.1, and 2.2)

- High-pressure processing (HPP) has been introduced as a technology to control bacterial pathogens and spoilage organisms in perishable foods, particularly ready-to-eat meats. However, application of HPP technology to control bacterial pathogens was limited by the lack of data on the bactericidal effect of treatments, particularly when they were present at low cell counts. The focus of this research project funded by AI Bio and ALMA was to characterize bacterial pathogens and non-pathogenic organisms for their resistance to high-pressure processing alone or in combination with antimicrobials to develop a collection of bacterial strains that can be used to validate high-pressure processes applied to foods. The resistance mechanisms of *Escherichia coli* (*E. coli*) and *Clostridium* strains were determined based on the pressure resistance in the presence of salt. *E. coli* strain cocktails were tested for pressure treatment in ground beef. The findings from the project indicate that HPP should be performed in combination with temperature treatments and/or antimicrobials; pressure treatment alone is not enough to deactivate a particular *E. coli* strain as it is highly tolerant to pressure. This project provided additional data on the pressure resistance of a large number (greater than 200) of pathogenic bacteria, and developed five strain cocktails that match industrial practices on ground beef. (Relevant to long-term outcomes 1, 2, and 3 and initiatives 1.1, 1.2, 1.3, 1.4, 2.1, and 2.2)

- The meat industry currently uses a number of intervention strategies and end-product testing to ensure the microbiological safety of its products. However, bacterial pathogens, including pathogenic *E. coli*, continue to contaminate finished meat products, leading to foodborne illnesses and massive recalls. AI Bio has supported development of a miniaturized molecular testing platform called cassette PCR for detection of pathogenic *E. coli* in meat products. The innovation allows a non-expert operator to prepare a meat sample, perform the test for detection of pathogenic *E. coli* within a work shift and determine its

safety before the meat is shipped and distributed. AI Bio is working with the research team to bring the technology to market, to expand the technology to detection of other food-safety-related pathogens, and to validate the technology in the field. (Relevant to long-term outcome 2 and initiatives 2.1 and 2.2)

For the 2014–15 fiscal year, the Food Innovation Team managed 43 active projects in Food Innovation, 11 of which were in the area of food safety, and 32 in the area of competitive food ingredients, food products, beverages and supplements, and innovative food processing and packaging.

Business Line: Ecosystem Services

Goal 4: Integrated Land and Environmental Management

Long-Term Outcomes

1. Use of interdisciplinary science to inform policy, programs, and management systems
2. Management of net greenhouse gas (GHG) emissions using biological systems
3. Support for measuring and monitoring of provincial biological resources
4. Effective use of market-based instruments to manage ecosystem services

Initiatives

1. Create a science-based value proposition for a market-based approach to enhancing ecosystem services
    - 1.1 Develop an ecosystem services assessment protocol to quantify the supply of ecosystem services on any given landscape
    - 1.2 Establish a credible open-source data and information management system to inform land-use and management decisions and trade-off choices
    - 1.3 Lead development and delivery of multidisciplinary, cross-sector, applied proofs of concept (pilots)
    - 1.4 Enable a network to collaboratively advance knowledge on the use of market-based instruments, markets, and socioeconomics for enhancing ecosystem services
    - 1.5 Invest in collaborative cross-sector interdisciplinary research and development initiatives
    - 1.6 Establish a global network for ecosystem services and market-based instruments
    - 1.7 Catalyze knowledge exchange through supporting events and activities that build common understanding and approaches across sectors and disciplines
2. Deliver a biological GHG management program and projects, in partnership with the Climate Change and Emissions Management Corporation (CCEMC), to reduce GHGs or increase sequestration of carbon
    - 2.1 Invest in research and development projects
    - 2.2 Establish credible data to inform industry decision-making
    - 2.3 Gather and disseminate relevant GHG management information

Results Category	Performance Measure	Actual Results 2013–14
Projects	The number of projects, programs, or initiatives supported by AI Bio, for which the final report was received by the end of 2014 or which are otherwise considered closed, and which were evaluated for achievement of outputs or outcomes as reported in the table below	6
Immediate Outcomes		
Knowledge that is likely to lead to practice change	The number of potential or actual changes in practice	1

Knowledge that is likely to lead to policy or regulation change	The number of potential or actual changes in policy or regulation	3
Knowledge that resulted in significant new directions in science or innovation	The number of confirmed proofs of concept, new avenues opened for exploration, new memoranda of understanding, etc. (e.g., *Identified 300 organic compounds residing in the soil throughout the growing season of wheat and canola, which may lead to new farming practices and products*)	7
Immediate Outputs		
Knowledge management that occurred with industry, government, and others	Over the life of a project, program, or initiative, the number of seminars or workshops coordinated, presentations delivered, articles published in non-academic publications, newsletter editions issued, active websites developed, crop walks or tours coordinated, etc. for which the audience was from industry, government, or other sectors	11
Knowledge management that occurred with academia	Over the life of a project, program, or initiative, the number of published peer-reviewed papers, abstracts, or book chapters; scientific conference program or poster presentations; or other endeavours for which the audience was mainly from academia	7

Ecosystem Services — Key Achievements in 2014–15

- In October 2014, AI Bio and the CCEMC, through the Biological Greenhouse Gas Management Program,[3] co-hosted the second annual Biological Solutions Forum, titled Building the Business Case. The forum attracted over 100 senior leaders from industry, government, and academia to informational talks and case study analyses that promote the use of biological feedstocks and processes as an economically viable approach to reducing net emissions in the province. Two affiliated workshops were also hosted. Collaborations arising from these workshops led to successful funding applications to the CCEMC in 2015. (Relevant to long-term outcome 2 and initiatives 2.2 and 2.3)

- With funding from the CCEMC and AI Bio, the Biological GHG Management Program contracted nine new research and development projects with a total cash value of $4.7 million. These projects will advance understanding of such critical areas as the genetic link between beef metabolism and GHG emissions, carbon cycling in wetlands, the use of nitrification inhibitors to reduce emissions from crop production, development of a biologically based spray foam insulation product and the techno-economic potential of algae-based diluents for use by the oil industry. (Relevant to long-term outcome 2 and initiatives 2.1 and 2.2)

- In partnership with Alberta Innovates Energy and Environment Solutions, AI Bio commissioned Hatch to produce an analysis titled "Alberta Biomass and Gas to Liquids (BGTL) Scoping Study." Although the public-facing version of this report has not yet been released, results arising from this work influenced the decision to host a workshop intended to bring together industry partners with interest in generating and using blended bio and natural gas. (Relevant to long-term outcome 2 and initiatives 2.2 and 2.3)

- Results arising from the Protocol Validation Study were adopted by the Canadian Fertilizer Institute in preparing a request for modification to the "nitrous oxide emission reduction protocol" and were presented as supporting evidence to ESRD. ESRD completed revisions to the protocol late in 2014 and adoption of the revisions is likely in 2015. (Relevant to long-term outcome 2 and initiatives 2.1, 2.2, and 2.3)

[3] Activities in support of the Biological GHG Management Program are funded through a separate grant agreement from the CCEMC, which is outside of AI Bio's grant from IAE. A separate detailed business plan for this program will be submitted to the CCEMC.

- The program produced the document *Biological GHG Management – a Primer* to meet the needs of a broad group of stakeholders. The Primer has been shared widely within government and industry and provides factual analysis of the challenges and opportunities of reducing emissions for biological systems as well as biological carbon sequestration. (Relevant to long-term outcome 2 and initiatives 2.2 and 2.3)

- In addition to managing net GHG emission reductions, AI Bio's other priorities relating to ecosystem services focus on creating the system and capacity necessary for effective and successful application of market-based approaches. The foundational pieces include a data and information system, biophysical and ecological science (ecosystem services assessment), and socioeconomics (market-based instrument design):

    - The Ecosystem Services Assessment is one of the foundational programs funded by AI Bio. Led by the Alberta Biodiversity Monitoring Institute (ABMI), the program uses simulation models and maps to help understand ecosystem services supply and how this supply changes with various land management activities. This work will generate the knowledge to support the creation of a range of market-based instruments, land-use planning, and monitoring. It will establish simple yet credible systems for assessing ecosystem services and documenting environmental integrity. Phase 1 of the project has been completed with Phase 2 beginning in 2015. (Relevant to long-term outcome 1 and initiatives 1.1, 1.3, 1.4, and 1.7)

    - The Bio-Resource Information Management System, led by the Silvacom Group and funded by AI Bio, developed a working prototype for a credible open-source data and information management system to inform land-use and management decisions and trade-off choices. The project is currently in the final phase of a four-phased approach. The final phase has been approved and initiated with completion expected in 2017. (Relevant to long-term outcomes 1 and 3 and initiatives 1.2, 1.3, 1.4, and 1.7)

    - The Algar Proof of Concept, led by the Silvacom Group and funded by AI Bio, looked at the changes in ecosystem services and the costs and benefits associated with restoration efforts taking place in the area of Algar, Alberta. This area is of particular importance in Alberta as a significantly disrupted habitat for woodland caribou. The first phase of the project completed a preliminary ecosystem services assessment and cost-benefit analysis to measure water regulation, carbon storage, timber supply, biodiversity intactness, and caribou habitat. The report for this project phase was widely shared. The second phase of the project will include a more comprehensive socioeconomic analysis and review and improvement of the data, methodologies, and models, with a view to applying the methodologies to other regions. This project will be completed in 2018. (Relevant to long-term outcome 1 and initiatives 1.3, 1.4, and 1.7)

- In early 2015, the Alberta Land Institute, with financial support from AI Bio, launched the Alberta's Living Laboratory Wetlands Project, which will work in partnership with private landowners to better understand wetland restoration. This research project helps to address priorities in the provincial wetlands policy and advances ecosystem services approaches to land management. The study will provide a better understanding of the functional values of wetlands—benefits such as flood mitigation and water purification—and address the practical question of compensation for landowners who agree to restore wetlands on their land using reverse auctions (market-based instrument). (Relevant to long-term outcomes 1 and 4 and initiatives 1.3, 1.5, and 1.7)

- In collaboration with the Canadian Oil Sands Innovation Alliance and Alberta Innovates Energy and Environment Solutions, AI Bio supports the Alberta Biodiversity Chairs program, a four-year program in its second year. Under this program, two Biodiversity Conservation Chairs at the University of Alberta provide dedicated science capacity to link the monitoring of outcomes with policy development and strategic planning. (Relevant to long-term outcome 1 and initiative 1.5)

- The Waterton Biosphere Reserve Association, with financial support from AI Bio, led a project that looked at ecosystem-scale monitoring of population trends for grizzly bears and wolves in southwestern Alberta. Non-invasive monitoring techniques were used to track species distribution and population changes. This important data will help researchers understand the spatial variability of biodiversity intactness and the value of land management in biodiversity conservation. (Relevant to long-term outcomes 1 and 3 and initiatives 1.5 and 1.7)

- A multi-year project on water management in Alberta is a collaborative effort among AI Bio, Alberta Innovates Energy and Environment, Environment and Sustainable Resource Development, and the University of Alberta. It will provide information required for the development of integrated source water management policies in Alberta. (Relevant to long-term outcome 1 and initiatives 1.4, 1.5, and 1.7)

- AI Bio is partnering with the Alberta Livestock and Meat Agency on a research project to provide a basic understanding of how grazing alters grassland carbon stores. This will provide insight into how managers can optimize carbon storage. (Relevant to long-term outcomes 1 and 3 and initiative 1.5)

- AI Bio, working with the ABMI, Alberta Innovates Technology Futures, the Land Stewardship Centre, and Silvacom, initiated the establishment of a network to collaboratively advance knowledge on the use of market-based instruments, markets, and socioeconomics for enhancing ecosystem services. (Relevant to long-term outcomes 1 and 4 and initiatives 1.4 and 1.7)

AI Bio currently supports 31 active projects in the ecosystem services business line.

Business Line: Prion and Prion-Like Neurological Diseases

Goal 5: Effective Management of Prion and Prion-Like Neurological Diseases

Long-Term Outcomes

1. Reduction in risk management costs of prion diseases in livestock industries and wild cervid management
2. Research leadership in prion and human neurodegenerative diseases

Initiatives

1. Improve understanding of the processes involved in prion disease to inform risk management and policy around managing these diseases
2. Target investment toward the problems of livestock industries and wildlife managers to reduce industry costs, more effectively control disease in the wild, and develop new products
3. Build on Alberta's strengths and opportunities to develop new insight into prion-like neurodegenerative diseases, with the potential for long-term application in prevention, treatment, and products
4. Build on Alberta's expertise in prion and protein misfolding research to strengthen Alberta's position as an international leader in these fields
5. Attract additional funding to leverage AI Bio's investment in prions

Results Category	Performance Measure	Actual Results 2014–15

Projects	The number of projects, programs, or initiatives supported by AI Bio, for which the final report was received by the end of 2014 or which are otherwise considered closed, and which were evaluated for achievement of outputs or outcomes as reported in the table below	14
Immediate Outcomes		
Knowledge that is likely to lead to a new or improved product, process, or service, or improved market access	The number of potential or actual patents, licence agreements, registrations, etc.	21
Knowledge that is likely to lead to practice change	The number of potential or actual changes in practice	4
Knowledge that is likely to lead to policy or regulation change	The number of potential or actual changes in policy or regulation	4
Knowledge that resulted in significant new directions in science or innovation	The number of confirmed proofs of concept, new avenues opened for exploration, new memoranda of understanding, etc. (e.g., *Identified 300 organic compounds residing in the soil throughout the growing season of wheat and canola, which may lead to new farming practices and products*)	16
Immediate Outputs		
Highly qualified personnel developed through our projects, programs, and initiatives	The number of individuals involved on a project, program, or initiative who are supported by a grant or contract and who are undergraduate students, graduate students, post-doctoral fellows, or post-secondary graduates with a diploma or degree	106
Knowledge management that occurred with industry, government, and others	Over the life of a project, program, or initiative, the number of seminars or workshops coordinated, presentations delivered, articles published in non-academic publications, newsletter editions issued, active websites developed, crop walks or tours coordinated, etc. for which the audience was from industry, government, or other sectors	8
Knowledge management that occurred with academia	Over the life of a project, program, or initiative, the number of published peer-reviewed papers, abstracts; book chapters, or scientific conference program or poster presentations; or other endeavours for which the audience was mainly from academia	54

Prion and Prion-Like Neurological Diseases — Key Achievements in 2014–15

- The Alberta Prion Research Institute (APRI)[4] continued its partnership with the Alzheimer Society of Alberta and Northwest Territories. Together, the two agencies funded five new research projects through the Alberta Alzheimer Research Program. APRI also managed the applications for and adjudication of the Ed & Joyce Lyons Postdoctoral Fellowship. (Relevant to long-term outcome 3 and initiatives 3, 4, and 5)

- David Westaway, APRI-supported researcher and director of the Centre for Prions and Protein Folding, was renewed as a Canada Research Chair in Prion Diseases (Tier 1). (Relevant to long-term outcome 3 and initiatives 3 and 4)

[4] Activities in support of APRI are funded through a separate grant agreement from IAE, which is outside of AI Bio's grant from this ministry. A separate report will be submitted to the department specific to this funding agreement.

- APRI hosted an MLA Breakfast to provide elected representatives with an update on the research being done in Alberta and to highlight the return on the government's investment in prion research. (Relevant to initiative 1)

- Twelve trainees received travel grants to attend the PRION 2014 conference in Trieste, Italy. Charles Mays and Ester Vazquez Fernandez, postdoctoral fellows from the University of Alberta, received two of the three top prizes for scientific presentations by students and trainees. (Relevant to long-term outcome 3 and initiative 4)

- APRI co-hosted a second research workshop with the São Paulo Research Federation and the Rio de Janeiro Research Federation. Twenty researchers and graduate students from Canada attended the workshop in Ubatuba, Brazil, to present their latest research findings. This meeting helped to facilitate long-term collaborations between Alberta and Brazil. (Relevant to long-term outcome 3 and initiatives 3 and 4)

- APRI hosted the fourth annual instalment of the lecture series The Prion Diaries, with Jay Ingram. The series has been successful in reaching out to Albertans to inform them about the impacts of prion diseases and the research currently being done in Alberta. Lectures were held in Brooks, Lloydminster, and Pincher Creek. Around 200 people attended in total. (Relevant to long-term outcome 3 and initiative 4)

- APRI partnered with Alberta Innovates Health Solutions, Campus Alberta Neuroscience, and the Alzheimer Society of Alberta and Northwest Territories to host The Alzheimer's Mystery, a lecture series featuring Jay Ingram and funded researchers. More than 400 people attended the lectures held in Calgary, Edmonton, and Lethbridge. (Relevant to long-term outcome 3 and initiative 4)

- APRI hosted a scientific meeting for its funded researchers and trainees to provide updates on their research. There were 22 oral presentations and 28 poster presentations. (Relevant to long-term outcome 3 and initiatives 3 and 4)

- An international group of 40 researchers, policy-makers, regulators, veterinarians, and industry members attended the International Discussion on Specified Risk Materials. APRI brought this group of experts together to discuss the issues that specified risk materials pose for industry, food safety, and risk. The discussion will help APRI work with industry and government to develop future research strategies. (Relevant to long-term outcomes 1, 2, and 3 and initiatives 1, 2, 3, and 4)

- APRI researchers found a number of small portions of the chronic wasting disease prion, which might serve as the basis for vaccine development. (Relevant to long-term outcomes 1 and 2 and initiative 3.)

- APRI researchers found a way to detect the form of amyloid from Alzheimer's disease in white blood cells. (Relevant to long-term outcome 3 and initiatives 3 and 4.)

In 2014–15, APRI managed 39 research projects for $4.7 million.

Separate Grant Agreements

Activities in support of the Driving Conversion of Alberta's Biomass to Advanced Materials and Chemicals Program (AMCP), the Alberta Bio Future Program, the Biological GHG Management Program, and APRI are funded via separate grant agreements that are outside of AI Bio's grant from Innovation and Advanced Education. Separate reports will be submitted to the department specific to the AMCP, the Alberta Bio Future Program, and APRI. For the Biological GHG Management Program, a separate detailed annual report will be submitted to the CCEMC.

6. Management's Discussion and Analysis

The results presented in AI Bio's audited financial statements are shaped by our mandate from the Government of Alberta: to provide leadership and coordination for research and innovation that support the growth and diversification of Alberta's agriculture, forest, and related life sciences sectors. In our fifth full year of operation, the wide-ranging expertise of our Board has guided our allocation of research funding in our priority areas of sustainable production, food innovation, bioindustrial innovation, ecosystem services, and prion and protein misfolding diseases. AI Bio continues to operate in alignment with its corporate bylaws, code of conduct policy, conflict of interest policy, and intellectual property practice.

We have been able to establish valuable partnerships with provincial, national, and international agencies that align with our interests and the needs of our stakeholders. We have been careful stewards of the resources of our stakeholders, leveraging funding from industry, government, and Alberta Innovates partners. Alberta's $33-billion (2014 sales) agriculture, food, and forest sectors represent a remarkable economic engine that will continue to grow in the face of global interest in food security, green technology, environmental sustainability, water scarcity, and healthy societies.

In the 2014–15 financial statements, the Statement of Financial Position shows net assets of $8.639 million and cash of $23.067 million, which includes $5.889 million in cash for the Alberta Prion Research Institute and $4.554 million for the Alberta Bio Future Program. Cash has increased by $6.412 million from the 2013–14 reported balance. Because we are able to retain resources into other fiscal years, we can plan for longer-term opportunities in our areas of focus. The $2.188-million increase over last year in deferred revenue is primarily due to a number of partners' increased investments in AI Bio for specific programming.

In the 2014–15 Statement of Operations, revenues of $21.257 million were earned and $21.101 million in expenses were incurred, resulting in a net operating surplus of $156,000, which slightly increased the accumulated surplus carried forward from previous years to $8.639 million.

7. Operational Overview

Alberta Innovates is the province's only group of organizations with a pan-Alberta legislative mandate to fund and perform research, innovation, and commercialization across multiple sectors. The Alberta Innovates group comprises one advisory board, the Alberta Research and Innovation Authority, along with four research corporations: Alberta Innovates Bio Solutions, Alberta Innovates Energy and Environment Solutions, Alberta Innovates Technology Futures, and Alberta Innovates Health Solutions. All but Alberta Innovates Health Solutions report to the Minister of Innovation and Advanced Education (IAE)—as do Alberta's post-secondary research institutions. This enhances alignment and collaboration on many levels. Alberta Innovates Health Solutions reports to the Minister of Health. While the Alberta Innovates corporations are assigned responsibility for advancing research and innovation in discrete sectors, AI Bio partners with its Alberta Innovates colleagues in areas of common interest.

With a staff of 21, AI Bio funds research and innovation at different stages of the innovation continuum to grow and diversify industries in Alberta's agriculture, food, and forest sectors. Along the innovation continuum, AI Bio supports the discovery of new knowledge, the application of that knowledge, and its knowledge translation or commercialization. AI Bio also leads strategy development and specific initiatives, evaluates technologies and emerging opportunities, facilitates connections, creates and expands networks, and manages knowledge and communication.

The current downturn in oil prices reconfirms the importance of a diverse economy. In 2014, the province's agriculture, food, and forest industries contributed more than $33 billion in sales to Alberta's diversified economy,

almost equal to sales from the petrochemical sector (source: Statistics Canada and IAE, 2015). Al Bio believes that through research and innovation, these sectors can contribute in an even more significant way.

Over the last year, we had changes in staffing, welcoming Julia Necheff and saying goodbye to Elisa Valade and CEO Stan Blade. After several months of rotating the acting CEO role among the Al Bio executive directors, Steve Price was appointed CEO for an interim period.

Also this year, the term of Board member Dr. Jackie Shan expired.

In 2014–15, recruitment commenced for a new CEO. Recruitment also started for six new Board members, in order to achieve a full complement of 12 Board members. No recruitment decisions were finalized at the time of writing this report.

In fall 2014, a new three-year collective agreement was signed with the Alberta Union of Provincial Employees, which guides the salary compensation for six of Al Bio's staff.

An initiative to integrate Genome Alberta into Al Bio was launched during the summer of 2014. Al Bio met with Genome Alberta staff to review policies, terms of employment, the pension plan, and the benefit plan, etc. A project team was established for integration of Genome Alberta's financial, IT, and other requirements, with IAE department staff to provide support through the shared-services agreement with Al Bio. Matt Bryman, Director of Programs with Genome Alberta, its only Edmonton-based employee, moved to the 18th floor of Phipps McKinnon. He is co-located with Al Bio staff.

In 2014–15, Al Bio was managing 174 active grant agreements with investment of $67.0 million over the lifetime of the projects and cash leveraging of $158.1 million. The amount of leverage that Al Bio investments are able to achieve shows that Al Bio has ability, skills, and connections valuable to other groups.

Al Bio's base funding from IAE for core business lines continued in 2014–15 at $11,049,000. Base funding from IAE supports a broad range of investments within four core business lines: sustainable production, bioindustrial innovation, food innovation, and ecosystem services.

Restricted funding to Al Bio supports several initiatives and business lines in addition to its core business lines. This type of funding is dedicated to a specific purpose that is complementary to activities supported by Al Bio base funding. It is administered by individual grant agreements for each restricted funding stream with specific reporting requirements to its funding partners. These are highlighted with specific references in Section 5.

No changes were made in 2014–15 to Al Bio's corporate bylaws, code of conduct policy, conflict of interest policy, or intellectual property practice.

Al Bio has followed the guidance provided by the Government of Alberta (GOA) on appropriate policies and procedures for transparency in reporting expenses for both its Board and senior management. Al Bio now voluntarily discloses travel, hospitality, and working session expenses for Board members and executive team members in alignment with the GOA policy on public disclosure of travel, meal, and hospitality expenses. Al Bio is also compliant with the GOA policy on salary disclosure.

Al Bio acknowledges the GOA's stated intent to continue to improve the relevance, effectiveness, and efficiency of the province's innovation system, and we continue to work with the GOA in pursuing this goal. Our programs and partnerships have demonstrated a history of good choices, and we expect to continue delivering needed research and innovation in Alberta. We submit this annual report in the belief that it describes the initiatives and investments that Alberta's agriculture, food, and forest industries require to be profitable and competitive while increasing sustainability.

8. Audited Financial Statements

AUDITOR GENERAL *Alberta*

Independent Auditor's Report

To the Board of Directors of Alberta Innovates—Bio Solutions

Report on the Financial Statements
I have audited the accompanying financial statements of Alberta Innovates—Bio Solutions, which comprise the statement of financial position as at March 31, 2015, and the statements of operations and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements
Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility
My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with Canadian generally accepted auditing standards. Those standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Opinion
In my opinion, the financial statements present fairly, in all material respects, the financial position of Alberta Innovates—Bio Solutions as at March 31, 2015, and the results of its operations, its remeasurement gains and losses, and its cash flows for the year then ended in accordance with Canadian public sector accounting standards.

ORIGINAL SIGNED BY: Merwan N. Saher, FCA

Auditor General

May 20, 2015

Edmonton, Alberta

ALBERTA INNOVATES – BIO SOLUTIONS

FINANCIAL STATEMENTS

MARCH 31, 2015

Statement of Operations

Statement of Financial Position

Statement of Cash Flows

Notes to the Financial Statements

Schedule 1 – Expenses Directly Incurred Detailed by Object

Schedule 2 – Salary and Benefits Disclosure

Schedule 3 – Related Party Transactions

Schedule 4 – Allocated Costs

MANAGEMENT'S RESPONSIBILITY FOR REPORTING

Alberta Innovates – Bio Solutions' (AI-Bio) management is responsible for the preparation, accuracy, objectivity and integrity of the information contained in the annual report including the financial statements, performance results and supporting management information. Systems of internal control are designed and maintained to produce reliable information that meet reporting requirements, and to ensure that transactions are executed in accordance with all relevant legislation, regulations and policies, reliable financial records are maintained, and assets are properly accounted for and safeguarded. The Annual Report has been approved by the Board of Directors and is prepared in accordance with ministerial guidelines.

The Auditor General of the Province of Alberta, the corporation's external auditor appointed under the *Auditor General Act*, performs an annual independent audit of AI-Bio's financial statements in accordance with Canadian generally accepted auditing standards.

ORIGINAL SIGNED BY:

Steve Price – Chief Executive Officer
Alberta Innovates – Bio Solutions

May 20th 2015
Date

ORIGINAL SIGNED BY:

Darrell Dancause – Executive Director and
Senior Financial Officer, Corporate Services
Innovation and Advanced Education

May 20th 2015
Date

ALBERTA INNOVATES - BIO SOLUTIONS
STATEMENT OF OPERATIONS
FOR THE YEAR ENDED MARCH 31, 2015

	2015 Budget (Note 3)	2015 Actual	2014 Actual
		(in thousands)	
Revenues			
Government Transfers			
Government of Alberta Grants	$ 26,323	$ 20,115	$ 16,362
Investment Income	200	282	258
Other Revenue	974	860	1,245
	27,497	21,257	17,865
Expenses - Directly Incurred (Note 2, Schedules 1 and 4)			
Administration	1,950	1,448	1,490
Prion & Protein Misfoldng Diseases	7,072	5,684	3,863
Sustainable Production	3,872	4,270	3,232
Bioindustrial Innovation	11,095	4,652	7,815
Food Innovation	3,225	2,376	2,391
Ecosystem Services	3,860	2,496	3,046
New Investments	1,800	175	-
	32,874	21,101	21,837
Annual Operating Surplus (Deficit)	$ (5,377)	$ 156	$ (3,972)
Accumulated Surplus, Beginning of year		8,483	12,455
Accumulated Surplus, End of year		$ 8,639	$ 8,483

The accompanying notes and schedules are part of these financial statements.

ALBERTA INNOVATES - BIO SOLUTIONS
STATEMENT OF FINANCIAL POSITION
AS AT MARCH 31, 2015

	2015	2014
	(in thousands)	
Assets		
Cash (Note 4)	$ 23,067	$ 16,655
Accounts Receivable	110	4,222
	$ 23,177	$ 20,877
Liabilities		
Accounts Payable and Accrued Liabilities	$ 1,232	$ 1,276
Deferred Revenue (Note 5)	13,306	11,118
	14,538	12,394
Net Assets		
Accumulated Operating Surplus	8,639	8,483
	$ 23,177	$ 20,877

Contractual obligations (Note 7)

The accompanying notes and schedules are part of these financial statements.

Approved by the Board of Directors:

ORIGINAL SIGNED BY: Art Froehlich

Director — May 20/15 Date

ORIGINAL SIGNED BY: Brian Hesje

Director — May 20, 2015 Date

ALBERTA INNOVATES - BIO SOLUTIONS
STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED MARCH 31, 2015

	2015	2014
	(in thousands)	
Operating Transactions		
Annual Operating Surplus (Deficit)	$ 156	$ (3,972)
Decrease (Increase) in Accounts Receivable	4,112	(3,705)
(Decrease) Increase in Accounts Payable and Accrued Liabilities	(44)	481
Increase in Deferred Revenue	2,188	4,232
Cash Provided by (Applied to) Operating Transactions	6,412	(2,964)
Increase (Decrease) in Cash	6,412	(2,964)
Cash, Beginning of Year	16,655	19,619
Cash, End of Year	$ 23,067	$ 16,655

The accompanying notes and schedules are part of these financial statements.

ALBERTA INNOVATES – BIO SOLUTIONS

NOTES TO THE FINANCIAL STATEMENTS

MARCH 31, 2015

NOTE 1 AUTHORITY AND PURPOSE

Alberta Innovates – Bio Solutions (the Corporation) is a Provincial Corporation, as defined in the *Financial Administration Act*, that was established on January 1, 2010 and operates under the authority of the *Alberta Research and Innovation Act*. The objectives of the Corporation are to support, for the economic and social well-being of Albertans, bio-industries research and innovation activities aligned to meet Government of Alberta priorities, including, without limitation, activities directed at the development and growth of the bio-industries sector, the discovery of new knowledge and the application of that knowledge.

The Corporation is exempt from income taxes under the *Income Tax Act*.

NOTE 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES

These financial statements are prepared in accordance with Canadian Public Sector Accounting Standards.

The measurement of certain assets and liabilities is contingent upon future events; therefore, the preparation of these financial statements requires the use of estimates, which may vary from actual results. Management uses judgment to determine such estimates. In management's opinion, the resulting estimates are within reasonable limits of materiality and are in accordance with the significant accounting policies summarized below.

a) Basis of Financial Reporting

Revenue

All revenues are reported on the accrual basis of accounting. Cash received for which goods or services have not been provided by year end is recorded as deferred revenue.

Government Transfers

Transfers from the Government of Alberta, federal and other governments are referred to as government transfers.

Government transfers and the associated externally restricted investment income are recorded as deferred revenue if the terms for use of the transfer, or the terms along with the Corporation's actions and communications as to the use of the transfer, create a liability. These transfers are recognized as revenue as the terms are met and, when applicable, the Corporation complies with its communicated use of the transfer.

NOTE 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Cont'd)

All other government transfers, without terms for the use of the transfer, are recorded as revenue when the transfer is authorized and the Corporation meets the eligibility criteria (if any).

Other Revenue
Other revenue includes the reimbursement of expenses from other organizations.

Investment Income
Investment income is interest income and is recorded on the accrual basis where there is reasonable assurance as to its measurement and collection.

Expenses

Directly Incurred
Directly incurred expenses are costs the Corporation has primary responsibility and accountability for. In addition to program operating expenses such as salaries, supplies, etc., directly incurred expenses also include:

- pension costs which are the cost of employer contributions for current service of employees during the year, and
- valuation adjustments representing the change in management's estimate of future payments arising from obligations relating to vacation pay.

Grants are recognized as expenses when authorized, and eligibility criteria, if any, are met.

Incurred by Others
Services contributed by other entities in support of the Corporation's operations have not been recorded in the financial statements and are disclosed in Schedule 4.

Valuation of Financial Assets and Liabilities

The Corporation's financial assets and liabilities are generally measured as follows:

Financial Statement Component	Measurement
Cash	Amortized Cost
Accounts Receivable	Amortized Cost
Accounts Payable and Accrued Liabilities	Amortized Cost

The Corporation has no assets or liabilities in the fair value category, has not engaged in foreign currency transactions and has no remeasurement gains or losses. Consequently, no statement of remeasurement gains or loss has been provided.

NOTE 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Cont'd)

Assets

Financial assets are assets that could be used to discharge existing liabilities or finance future operations and are not for consumption in the normal course of operations. Financial assets of the Corporation are limited to financial claims, such as advances to and receivables from other organizations, employees and other individuals.

Liabilities

Liabilities are recorded to the extent that they represent present obligations as a result of events and transactions occurring prior to the end of fiscal year. The settlement of liabilities will result in sacrifice of economic benefits in the future.

Net Assets

Net assets represent the difference between the carrying value of assets held by the Corporation and its liabilities.

Canadian Public Sector Accounting Standards require a "net debt" presentation for the statement of financial position in the summary financial statements of governments. Net debt presentation reports the difference between financial assets and liabilities as "net debt" or "net financial assets" as an indicator of the future revenues required to pay for past transactions and events. The Corporation operates within the government reporting entity, and does not finance all its expenditures by independently raising revenues. Accordingly, these financial statements do not report a net debt indicator.

Financial Risk Management

The Corporation's financial instruments include cash, accounts receivable and other assets and accounts payable and accrued liabilities. The Corporation is not involved in any hedging relationships through its operations and does not hold or use any derivative financial instruments for trading purposes.

The Corporation's financial instruments are exposed to credit risk, market risk and liquidity risk.

1) Credit Risk
   Credit risk relates to the possibility that a loss may occur from the failure of another party to perform according to the terms of a contract. The Corporation's accounts receivable are exposed to credit risk. Management manages this risk by continually monitoring the creditworthiness of counterparties and by dealing with counterparties that it believes are creditworthy.

2) Market Risk
   Market risk is the risk of loss from unfavourable change in fair value or future cash flows of a financial instrument causing financial loss. Market risk is

NOTE 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Cont'd)

comprised of currency risk, interest rate risk and price risk. The Corporation's cash is exposed to interest rate risk. Management manages this risk by continually monitoring the Corporation's deposits in the Consolidated Cash Investment Trust Fund (CCITF) and their corresponding rate of return.

3) Liquidity Risk
Liquidity risk is the risk that the Corporation will not be able to meet its obligations as they fall due. The Corporation's accounts payable and accrued liabilities are exposed to liquidity risk. Management manages this risk by continually monitoring cash flows.

It is management's opinion that the Corporation is not exposed to significant credit risk, market risk and liquidity risk arising from its financial instruments.

b) Future Accounting Changes

In March 2015 the Public Sector Accounting Board issued PS 2200 – Related party disclosures and PS 3420 – Inter-entity transactions. These accounting standards are effective for fiscal years starting on or after April 1, 2017.

- PS 2200 – Related party disclosures defines a related party and identifies disclosures for related parties and related party transactions, including key management personnel and close family members.

- PS 3420 – Inter-entity transactions, establishes standards on how to account for and report transactions between public sector entities that comprise a government's reporting entity from both a provider and recipient perspective.

Management is currently assessing the impact of these new standards on the financial statements.

NOTE 3 BUDGET
(in thousands)

A business plan with a budget deficit of $5,377 was approved by the Board on March 30, 2014 and the full financial plan was submitted to the Minister of Innovation and Advanced Education.

NOTE 4 CASH
(in thousands)

Cash in the amount of $23,067 (2014 - $16,655) include deposits in the Consolidated Cash Investment Trust Fund (CCITF) of the Province of Alberta. The CCITF is administered by the Ministry of Treasury Board and Finance with the objective of providing competitive interest income to depositors while maintaining appropriate

NOTE 4 CASH (Cont'd)

security and liquidity of depositors' capital. As at March 31, 2015, $13,296 of the cash balance is restricted as it represents grants received that have restrictions on their use (2014 - $7,088).

The portfolio is comprised of high-quality short-term and mid-term fixed-income securities with a maximum to maturity of three years. As at March 31, 2015, securities held by the Corporation had a time-weighted return of 1.2% per annum (2014: 1.2% per annum). Due to the short-term nature of CCITF investments, the carrying value approximates fair value.

NOTE 5 DEFERRED REVENUE
(in thousands)

Deferred revenue represents unexpended, externally restricted funds.

	2015				2014
	Prion Research Fund	AB Bio Futures Program	Other	Total	Total
Balance, beginning of year	$ 5,351	$ 2,000	$ 3,767	$ 11,118	$ 6,886
Grants received - Government of Alberta	5,729	2,625	2,610	10,964	9,629
Grants received - Other	415	-	-	415	75
Investment Income	49	-	-	49	50
Recognized as Revenue					
Investment Income	(49)	-	-	(49)	(50)
Grants from Government of Alberta	(5,462)	(71)	(3,514)	(9,047)	(5,291)
Grants from other	(144)	-	-	(144)	(181)
Balance, end of year	$ 5,889	$ 4,554	$ 2,863	$ 13,306	$ 11,118

NOTE 6 BENEFIT PLANS
(in thousands)

The Corporation participates in the multi-employer pension plans: Management Employees Pension Plan (MEPP), the Public Service Pension Plan (PSPP), as well as, a Supplementary Pension Plan (SRP) for Public Service Managers. The Corporation does not have sufficient plan information on MEPP, PSPP or the SRP to follow the standards for defined benefit accounting and therefore follows the standard for defined contribution accounting. Accordingly the pension expense for these pension plans is equivalent to the annual contributions of $370 (2014 - $396).

At December 31, 2014, the Management Employees Pension Plan reported a surplus of $75,805 (2013 – surplus $50,457), the Public Service Pension Plan reported a deficiency of $803,299 (2013 – deficiency $1,254,678) and the Supplementary Retirement Plan for Public Service Managers reported a deficiency of $17,203 (2013 – deficiency $12,384). The Corporation is not responsible for future funding of the plan deficit other than through contribution increases.

NOTE 7 CONTRACTUAL OBLIGATIONS

(in thousands)

Contractual obligations are obligations of the Corporation to others that will become liabilities in the future when the terms of those contracts or agreements are met.

	2015	2014
Obligations under contracts and grants	$ 16,961	$ 18,313

Estimated payment requirements for each of the next five years are as follows:

	Contracts	Grants	Total
2015-16	$ 392	$ 11,900	$ 12,292
2016-17	245	3,227	3,472
2017-18	218	465	683
2018-19	204	94	298
2019-20	216	-	216
	$ 1,275	$ 15,686	$ 16,961

NOTE 8 APPROVAL OF FINANCIAL STATEMENTS

These financial statements were approved by the Board of Directors.

ALBERTA INNOVATES - BIO SOLUTIONS
SCHEDULES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED MARCH 31, 2015

Schedule 1 - Expenses Directly Incurred Detailed by Object

	2015		2014
	Budget	Actual	Actual
	(in thousands)		
Grants	$ 26,291	$ 16,102	$ 16,744
Salaries, Wages & Employee Benefits	3,306	3,053	3,145
Supplies and Services	3,277	1,946	1,948
	$ 32,874	$ 21,101	$ 21,837

Schedule 2 - Salary & Benefits Disclosure

Year ended March 31, 2015

(In Thousands)

	2015				2014
	Base Salary [1]	Other Cash Benefits [2]	Other Non-Cash Benefits [3]	Total	Total
	(in thousands)				
Chairman of the Board	$ -	$ 41	$ 2	$ 43	$ 32
Board Members	-	30	1	31	23
Chief Executive Officer [4]	181	47	46	274	338
Executives:				-	
Executive Director, Ecosystem Services	181	2	51	234	228
Executive Director, Sustainable Production & Food Innovation	193	12	53	258	242
Executive Director, Prion [5]	169	-	-	169	169
Executive Director, Bioindustrial Innovation [6]	94	1	29	124	216
Executive Director, GHG Management Program	197	2	4	203	201
Director, Operations	124	2	40	166	154

[1] Base salary includes regular salary.

[2] Other cash benefits include honoraria for Board Members, car allowance for Chief Executive Officer, lump sum payments, and vacation payouts. No bonuses were paid in 2014 or 2015.

[3] Other non-cash benefits include employee benefits and contributions or payments made on behalf of employees including pension and supplementary retirement plan, health care, dental coverage, group life insurance, short and long term disability plans, Workers Compensation Board premiums, accomodations, learning account items, health spending account items and professional memberships.

[4] This position includes a lump sum payment of $9 and vacation payout of $42. The position was vacant from August 1, 2014 to October 13, 2014. The CEO responsibility was rotated between Executive Directors during that time. As of October 14th 2014, this position is also responsible for the Bioindustrial Innovation program.

[5] Base compensation is established through contractual agreement. No other cash or non cash benefits are provided.

[6] This position was combined with the CEO position effective October 14, 2014.

Schedule 3 - Related Party Transactions

Year ended March 31, 2015

Related parties are those entities consolidated or accounted for on a modified equity basis in the Government of Alberta's financial statements.

Entities in the Ministry refers to entities consolidated in the Ministry of Innovation and Advanced Education. Other entities outside of the Ministry relates to the remaining entities consolidated at the Provincial level.

Alberta Innovates - Bio Solutions had the following transactions with related parties which are recorded on the Statements of Operations and the Statements of Financial Position at the amount of consideration agreed upon between the related parties:

	Entities in the Ministry		Other Entities Outside of the Ministry	
	2015	2014	2015	2014
	(in thousands)			
Revenues				
Grants	$ 18,140	$ 15,848	$ 1,975	$ 514
Other	-	169	14	15
	$ 18,140	$ 16,017	$ 1,989	$ 529
Expenses – Directly Incurred				
Grants	$ 10,172	$ 10,177	$ 675	$ 425
Other Services	144	157	4	3
	$ 10,316	$ 10,334	$ 679	$ 428
Receivables from	$ 2	$ 3,502	$ 26	$ 545
Payables to	$ 698	$ 774	$ -	$ 46
Deferred Revenue	$ 11,571	$ 8,906	$ 1,220	$ 1,969
Contractual Obligations	$ 8,361	$ 12,661	$ 565	$ 840

The above transactions do not include support service arrangement transactions disclosed below.

The Corporation also had the following transactions with related parties for which no consideration was exchanged. The amounts for these related party transactions are estimated based on the costs incurred by the service provider to provide the service.

These amounts are not recorded in the financial statements. Accommodation expenses incurred by others are disclosed in Schedule 4.

	Other Entities Outside of the Ministry	
	2015	2014
	(in thousands)	
Expenses – Incurred by Others		
Accommodation [1]	$ 241	$ 250
	$ 241	$ 250

(1) The Corporation's share of accommodation costs is based on the proportion of space occupied compared to the total space occupied by all Ministries.

Schedule 4 - Allocated Costs

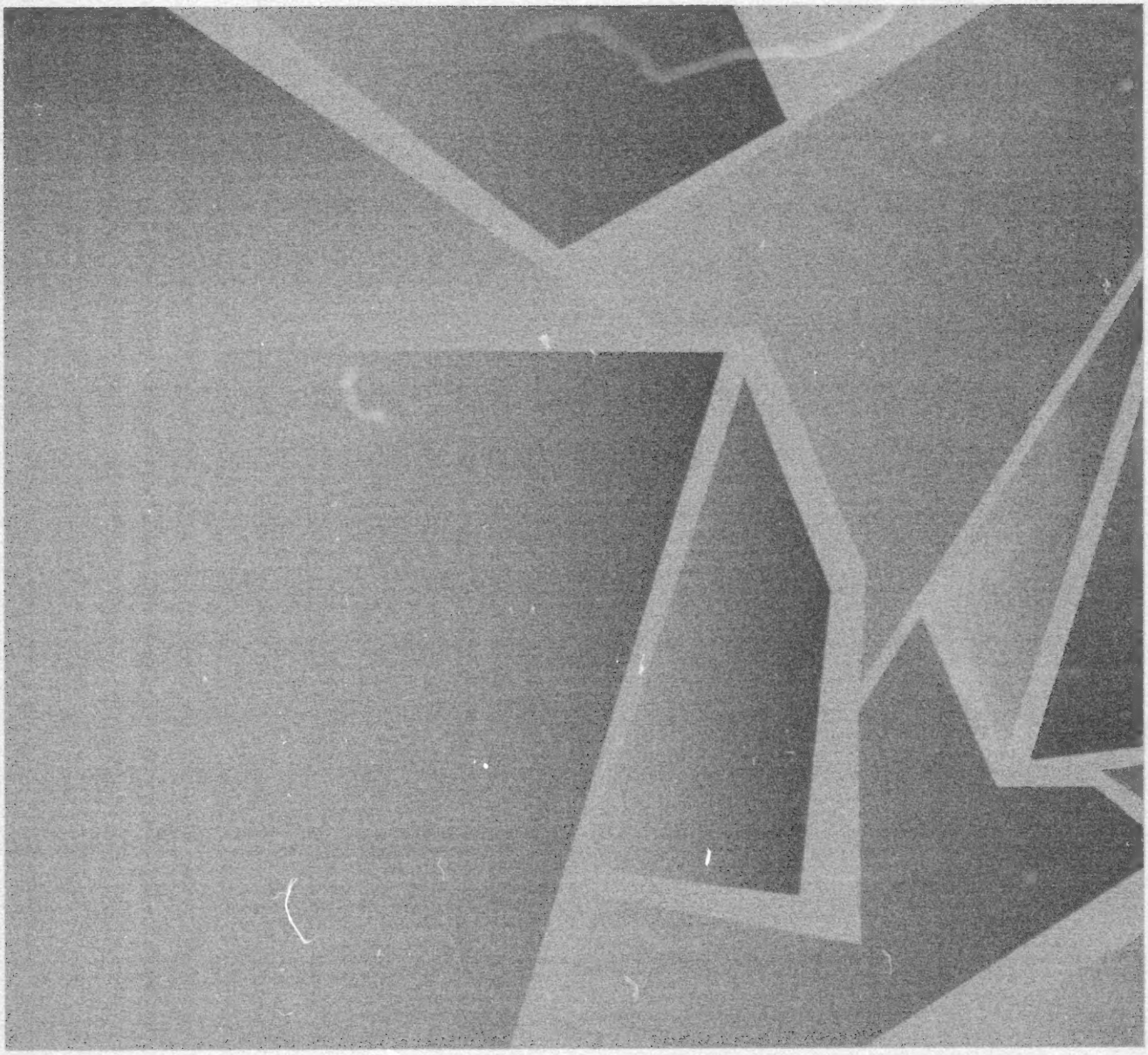
Year ended March 31, 2015

(in thousands)

	2015			2014
		Expenses incurred by others[2]		
	Expenses[1]	Accommodation Costs	Total Expenses	Total Expenses
Program				
Administration	$ 1,448	$ 241	$ 1,689	$ 1,740
Prion & Protein Misfolding Diseases	5,684	-	5,684	3,863
Sustainable Production	4,270	-	4,270	3,232
Bioindustrial Innovation	4,652	-	4,652	7,815
Food Innovation	2,376	-	2,376	2,391
Ecosystem Services	2,671	-	2,671	3,046
	$ 21,101	$ 241	$ 21,342	$ 22,087

[1] Expenses – Directly Incurred as per Statement of Operations.

[2] The Corporation receives financial processing and reporting services from the Department of Innovation and Advanced Education at no cost. The dollar value of these services cannot be accurately determined.



ALBERTA INNOVATES BIO SOLUTIONS

18th Floor, Phipps McKinnon Building, 10020-101 A Avenue
Edmonton, Alberta, Canada T5J 3G2
780-427-1956
bio@albertainnovates.ca

www.bio.albertainnovates.ca